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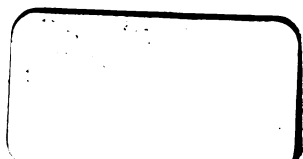
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The relation between science and philosophy, illustrated ...

Albert Julius Mott



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with the author's consent)

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THE RELATION BETWEEN
SCIENCE AND PHILOSOPHY,

ILLUSTRATED BY

MODERN VIEWS OF THE ANTIQUITY OF MAN.

INAUGURAL ADDRESS

READ BEFORE THE

LIVERPOOL LITERARY AND PHILOSOPHICAL SOCIETY.

OCTOBER 7TH, 1872.

BY

ALBERT J. MOTT, PRESIDENT.

INAUGURAL ADDRESS.

THE work of our Society, if compared with that of many kindred bodies, appears discursive and miscellaneous. We do not give ourselves to the systematic and exhaustive study of one or two special subjects. We do not arrange our Papers so that they may cover some field of inquiry marked out and limited for the inquirers; and our yearly volumes show nothing of that unity of purpose which we see in most scientific Transactions. This has often been brought against us as a reproach, but I venture to think we may be satisfied, and that, in our disregard of the ordinary canons of organisation, we not only carry out the Society's original purposes, but we do that which always needs to be done, and is especially needed at the present time.

The purposes of the Literary and Philosophical Society are indicated by its name, and their scope is clearly of the widest kind. For Literature includes all subjects on which books are written, and Philosophy is the summing up of human thought in the judgments of human wisdom. We could not, therefore, limit ourselves to particular subjects or modes of treatment, without abandoning the happy license which our name asserts for us; and, though this would be no reason against changing both name and method on sufficient grounds, there are, I think, considerations of the highest kind which should prevent us from doing so.

Science and Philosophy, Knowledge and Wisdom, though bound together by the closest ties, are not only distinct, but are in many ways dissimilar. Some knowledge is necessary to any wisdom, but the proportions in which the two may

coexist, differ in different cases to almost any degree. And while true wisdom is good in itself, whatever its origin, knowledge is neither good nor evil in itself, but is the necessary material out of which things, both good and evil, may be fashioned. It is the quarried stone and the felled timber, without which we can raise no temples here ; but temples and prison-houses are built with the same timber and the same stone, and the world may be either the better or the worse for its possession. Now the present time is one of unexampled activity and success in the attainment of knowledge. We are learning every day new facts about the things around us, some of the most interesting among them being of a class which in our own boyhood even were supposed to be quite beyond the reach of human investigation. There is no present symptom of any stoppage in this course of acquirement. The latest discoveries are rather of new paths into new regions, than of the things we may expect to find there; and though there will of course come a time of exhaustion, when we shall find ourselves again on the shores of a boundless sea where there is no ship ready to carry us any farther, that period is not yet in sight. The pleasure of discovery is intense. The fascination of Science grows more powerful as the veils between ourselves and nature drop one by one. The beauty hidden in this world alone is so unutterably great, so inexhaustibly new, so varied and so wonderful, that the search after it, as soon as it is successful, is all absorbing, and the desire for knowledge soon becomes the passion of our lives. You will not suppose I have a word to say in disparagement of scientific study. We are all agreed, not only as to its value, but as to its real necessity for the true ends of life. To live without it is to sit with closed shutters where the sun is shining ; to be content with poverty where palaces stand ready for us with open doors. But Science and Philosophy, like many things essential to

each other's welfare, are not always in perfect harmony on practical points; and the real present danger, the real tendency of modern intellectual labour, is that we should be satisfied with the heaping up of knowledge, especially of that received directly through the outward senses, or with shallow inferences from it, resulting from hasty thought; and should neglect as less interesting, and regard as less important, those views of our own true relation to whatever exists besides ourselves, which form the substance of philosophy. Great philosophers are not made by this or any other Society. They come among the strange erratic portents of new eras, over whose appearance we have no conscious power. But it is, I think, the office of our Society to encourage among its members a philosophic spirit, as distinguished from a purely scientific one; and we may do this by that very absence of concentration which enables us to discuss, and in this way to compare, a great variety of subjects, in the light of science, and with the aid of its methods of research, but with a wider object, dealing less with the details of knowledge and more with its results. With very little restriction, and this only of a precautionary kind, our evenings are open to the discussion of any subject really interesting to thoughtful men. We have, in consequence, among our members, representatives of every branch of learning; and on the questions considered here we get the views, not only of experts, but of intelligent outsiders, which, though of little value to science, are always of the highest interest to philosophy. Doubtless, we run some risk of encouraging shallowness instead of depth by this procedure, but it is our own fault if we do not escape this danger. To know everything about something, and something about everything, is a canon of study most admirable, where it can be applied. But it cannot always be applied, and if we are compelled to sacrifice one of its enactments, it is not always the truest wisdom to obey the

first. To know something about everything is of little worth, when the something known is of a superficial kind ; but it may be of the highest value, if our knowledge concerns the general principles of many things, though we are unable to master their details. I repeat, therefore, that I think we may be satisfied. The office of more strictly scientific associations is as necessary and as honourable as our own ; but we may recognise the fact of difference without any thought of rivalry, and continue our own course without doubting the wisdom of our founders.

In pursuance of this view, I shall ask you to-night to consider some remarks on the present state of philosophic thought, and then on its practical results in regard to our views of human life itself, as illustrated by the discussion concerning the antiquity of Man.

All scientific study leads irresistibly to an inquiry into the causes of natural phenomena.

Whatever our wish may be, we cannot, in fact, content ourselves by ascertaining the order in which events have succeeded each other in the past, and by forming the expectation that similar events will occur in similar order in the future. Why do we form this expectation ? Is there anything to satisfy our reason, if we say that such a thing will happen, because a similar thing has happened ? The very word "because" points out the answer to such a question. We cannot help distinguishing between causation and succession ; and we cannot help attributing every event, not to an antecedent, but to a cause. This is true in every system of philosophy, even in those which deny the fact. For these only blend the idea of cause with that of succession, and present the complex notion as a simple one, by omitting to analyse it.

The usual form in which it is thus presented, is by attributing all events to the operation of Law; and in this form it appears to special advantage, because we are all agreed that Nature is governed in accordance with laws, which are definite and permanent. But then, what is Law, and what is it to be governed by it?

There are, I believe, three possible answers to this question, and they lead at once to the roots of all philosophies.

By Law, we may intend to denote simply the facts of experience and expectation, without attempting to account for them. We may say, All bodies that we have tried to lift have resisted our efforts. We expect that all other bodies will resist in like manner, if we try to lift them. Our expectation is fixed, and will not change; and when we say it is a law that all bodies are heavy, we intend simply to assert these facts.

This answer dispenses altogether with the idea of cause, but its unsatisfactory nature is plain upon the surface. Most of us would say at once, that what we mean by Law is something different. We do not merely mean that things have happened, and expectations have been formed. We mean that those expectations are justified; that we have not only had experience, but that it has taught us something; that the law of occurrence is not the same thing as the fact.

The second answer, recognising this objection, defines law, not merely as the order in which events have occurred and are expected, but as the order in which they are compelled to occur, and in which, therefore, there is a reason why they should be expected.

Here a new element comes into the definition. The idea of compulsion includes the idea of that which compels,

and Power, not succession, becomes the essential element of law. Now Law itself is continually used in the sense of power. We speak of Law, meaning not only the Order, but the Agent of compulsory change; and it is through this species of personification, whereby an active force and a definite order are blended together as parts of one great and all-pervading Cause, that we are able to think of law as a real explanation of phenomena, and to believe that we may rest on it as upon solid ground.

But it needs no difficult analysis to disclose the want of any real connecting link between force and order, when brought together in this way. Law is not the name of any existing thing; of any Being in whom force and order are natural elements, working in natural harmony. It is, on the contrary, one of those names which stand as substitutes for things; which carry with them the idea of an existence, not in fact existing, and are therefore the most formidable blinds that hang between ourselves and truth. The word Law, which is of the utmost service while it is the name of that which is to be done, becomes a hindrance of the first order the moment we use it to denote the doer. Conscious that every act must have an agent, we seem to have named the agent, and so accounted for the act, when we say it is the result of law, and we forget that we have created an imaginary being out of a verbal metaphor.

The third answer to the question, What is law? goes to the root of the matter. Causation is the exercise of Power, and Law is the order in which power is in fact exerted. And Power is not succession or antecedence, but something else. The best thinkers of our own age, and of every age, have arrived at this final answer, and have agreed substantially so far. But two opposite systems of philosophy spring from this common foundation, and the conflict between them

affects our whole view of life and nature, of things past and present and to come.

What is this something else which we call Power, and which we recognise as the cause of change?

The answer on the one hand is, that Power is an element of Life, and that, when power is exerted, there is therefore a living being who exerts it.

On the other hand, it is affirmed, that power is either a property of matter, or else of some other thing whose nature is unknown.

Now, the first answer contains nothing of which the real meaning is obscure. The terms Life, Power, Living Being, and the exertion of Power, all refer directly to our own immediate consciousness. We know perfectly what we mean by them with reference to ourselves. That it is not only difficult, but impossible, to explain them by any simpler words, is the necessary result of the fact that they are names of things of which we are actually conscious. Immediate consciousness is, of course, the foundation of all knowledge. It is to it that we appeal, in conveying our thoughts to others; and we can appeal to nothing beyond it. We are all conscious of the things we mean by Life and Power and Existence, just as we are of pain and pleasure, sight and hearing. The object of all definition is to express ourselves in unmistakable words; and this is completely accomplished when the words themselves refer directly to the consciousness of both speaker and hearer.

But the second answer, which asserts that power is a property of matter, or of something unknown, is very different in its nature. I will not discuss the question as to our immediate consciousness of matter, or the meaning of these words, but will ask you to consider only what is meant by the word Property.

It is a fact that the word property describes ultimately

that of which we are really conscious ; but it is unfortunately the name of two very different things.

At the bottom of all our consciousness, lying there as the foundation of all we know, are the two Facts of Being and Doing. We know ourselves, and all other things appear to us, either as existing in certain modes, or acting in certain ways. We distinguish things external to ourselves sometimes by reference to what they are, sometimes to what they do. We use the word Property as a common name for That by which they are Distinguished ; and we say that certain objects have certain properties, with the intention of describing either the mode of their existence, or the manner of their action. But Being and Doing have nothing else in common ; and when we speak thus of the properties of things, it is essential that we should understand clearly to which class of facts we are referring.

Now when it is said that power of any kind is a property of matter, there is an evident commingling of two sets of ideas. We know that a material substance appears to do certain things, to move in certain ways. We call this its property, naming thereby merely the observed fact concerning its apparent action. But power means the cause of the action, not the act itself, and we do not know that the cause of the action is a property of the substance.

It is true, and it is certain, that the acts are done, that they have been done in an observed order, and that we expect that order to be continued. But the question is, how they are done, and on what ground we expect that order to be continued. If we find out their cause, and find also that it has a permanent existence, there is a solid reason for our expectation ; but if we find nothing but the acts themselves to account for their occurrence and recurrence, where is our solid reason ?

I see the fly-wheel of a steam engine moving round. To describe it intelligibly, as a fly-wheel, I must include the fact of its steady motion, which is thus spoken of as one of the properties of the wheel. The cause of this motion is the up and down movement of the piston, which, in the same sense, is a property of the piston. The piston moves on account of the expansive motion of the steam, which again is a property of the steam. The steam is made to expand by the heat-vibrations coming from the furnace, which are the property of a vibrating medium. The heat-vibration is set up by molecular motion in the fuel; the property of substances coming into chemical combination. The chemical combination is caused by the attraction of these bodies for each other, which is, we say, another property of the same substances.

Now in this analysis you will observe that, in every case except the last, the word property has reference to the manner in which acts are done; but in the last case, it has reference to the power by which they are done. That bodies have moved or are moving in certain ways, is a fact of observation; that there is a power which determines their motion in every case, is an unavoidable inference. When we say they attract each other, we only assert the existence of such a power, for which the word attraction is simply a convenient name. But acts are not powers, nor are powers acts; and the use of the word property to denote indiscriminately both of these things is, I think, one of the chief impediments to a proper understanding between science and philosophy.

When we use the word Property in the sense of Power, what is it that we are really speaking of? Can we describe it, or define it? You will find that we can only do this in one special way. Description and definition are simply the

comparison of the thing described with something else already known to us. If I wish to describe to you the face of a stranger, I do it by reminding you of some familiar face, and pointing out the likeness and the difference. But if I wish to describe a head-ache, how am I to do it? If I know that we have both felt pain of several kinds, and have similar recollections about it, I can describe my head-ache by comparison with some of these remembered pains. But otherwise it would be impossible to describe it.

Now power is like pain in this respect. We ourselves have it, and use it, and are conscious of its possession and its use; but we can only describe it by comparing it with something like itself. And as there is nothing like itself except its own varying forms, any description of power is a description of that which we ourselves are conscious of possessing. It is not, like external objects, or states, or acts, something of which we infer the existence from the facts of our own consciousness. We find it amongst those facts, and know it, not inferentially, but absolutely, as a necessary part of ourselves, without which we should not be ourselves.

Power is thus known to us as the Property of a Living Being, in a true and perfect sense, for it is one of the things by which a living being is definitely distinguished as such. But what else do we know about power, and what else are we speaking of when we attribute its possession to other things? We know absolutely nothing else. To say that any thing has power, is to say that it is like ourselves as living beings; and the reason why we are able to overlook this, and to think of power and life as separable, is a want of attention to the nature of our own experience, and to the grounds on which we infer the existence of any other power besides our own. This result is in no way evaded by the physical theory which regards our own consciousness of power as only the memory of muscular sensations; for in that case, what we mean by

power can be nothing but muscular sensation, and to attribute this to other objects is to treat them as if they were alive.

The real and only reasonable ground on which the idea of Law is founded I believe to be this: When we see anything done, we infer at once that there is some power which does it. When the same thing is done repeatedly, we infer that the same power repeats its acts. When it is regularly done under given circumstances, we infer that the acting power has a permanent existence, and that under those circumstances it exerts itself. An acting power means an existing actor. If an actor exists, who has regularly been known to do certain things under certain circumstances, it is reasonable to expect a repetition of the same things under the same circumstances; because it is circumstance that calls forth and determines action, as we know within ourselves.

Thus, the idea of law is always finally the idea of some existing actor, exerting power for some definite end. We think, indeed, of actors as inanimate objects, and disguise power under the name of property; but when we have done this, we find ourselves obliged to give back in metaphor what we have taken away in fact, and, having first got rid of personality by using the word law, we treat law itself as if it were a living person.

The distinction between acts and their causes, and the ultimate consequences of it, are well illustrated by the behaviour of a common magnet. A small piece of iron rests upon the ground. I hold a magnet over it, an inch above it, and nothing occurs that I am aware of. I bring the magnet down to within a quarter of an inch, and the piece of iron immediately springs upward to meet it. Now it does not spring upward merely because it is iron, for a larger piece will not move. And the latter does not lie still merely because it is heavy, for a piece of cork will do the same.

Again, if I gradually increase the size of the piece of iron, I find that the magnet must be moved nearer and nearer to it before it will rise, till I come to a point at which the disposition to rise seems exactly balanced by the disposition to lie still, and if at this point I put the iron in a scale, still holding the magnet over it, the iron would appear to have no weight in the scale.

What is the explanation of these phenomena ?

In the first place, the magnet on one side and the earth on the other appear to have the same relation to the piece of iron, but not to the piece of cork.

In the next place, what we really observe is not only that the iron and the cork act in certain ways, but that they have a tendency to act in these ways. The iron has a tendency to move towards the earth, and also to move towards the magnet ; the amount of this tendency varies with the distance between the objects, and there is a conflict between the two tendencies. The cork, on the other hand, cares nothing for the magnet, but clings to the earth. The iron is equally indifferent to the cork, though not so to either the earth or the magnet.

What I wish to point out is, that the facts here described are exactly like the phenomena produced by the action of a living being, and are not like anything else with which we are equally well acquainted.

The desire for something ; the effort to accomplish that desire ; the power of making such an effort ; the occurrence of many wishes, all of which cannot be gratified together ; a conflict between them resulting either in specific action or balanced inactivity ; inclination towards certain objects ; indifference to others ; these are the well known characteristics of what we call sentient life. That is to say, of life which in its essence is what we are conscious of in

ourselves. If we suppose the conduct of the earth, the magnet, the iron, and the cork to be a manifestation of life, it accords with that supposition, and there is no other hypothesis which really gives us the least real explanation of the facts observed. You know, of course, that modern theory falls back upon the supposition, that what we see in magnetism and gravitation is due in fact to the mere impact of invisible matter upon visible matter; but here, the true question is only evaded. Apart from the important truth that there is no experimental proof, and that the kind of motion which could account for the phenomena has never been conceived, the whole kinetic doctrine is obliged to include the assumption that different substances differ in their moving effects, and in the manner in which these occur, and this difference, if closely pressed, leads to exactly the same evidence of an initial choice, acting through a static power, and determining an initial effort.

We are compelled at last to speak, not of motion, but of Tendency. Now Tendency is something of which we have an absolute knowledge. We have mental tendencies, and they are neither more nor less than conditions of the will. Choice, preference, wish; these are the synonymes of tendency, and though the word, like most other words, refers literally to material objects in a certain state, it is that state precisely which implies the existence of a choice, and not of a motion.

Thus we come by every road to the conception of every change as the act of an existing actor, and the question, what is the nature of the actor, is the final question of philosophy. Is it, in the case of the visible universe, something unknown and unknowable, to which we give the name of force, only in despair of any better name, meaning when we use that word to assert our total ignorance of anything

but the fact that there is an unknown actor of some inconceivable kind? Or is it something of which we know the further fact, that as the possessor of will and power it is so far like ourselves? I shall not attempt here to argue this question, but shall make one suggestion in relation to it.

We ourselves have a certain power over material things. We are able to control their motion, and its results; and it is in our nature to exercise this control for definite and permanent purposes. Now if the universe has simply developed itself, in our case, into beings of this kind, there is every reason to expect that other beings of the same kind have also been developed. There is no reason to believe that our powers are the greatest possible, or that any extension of them which we can think of is impossible; and as there is no limit to the time during which development may have been going on, or to the material on which it may have operated, it is reasonable to expect that somewhere in the unlimited universe one or more beings would have been developed with powers equally unlimited. Such beings would use their powers, and would thus become, to an extent which we cannot measure, directors of the universe; even as we become its directors within the limits of our power. It follows therefore that, even supposing an unknown and lifeless Force to be in truth the origin of nature, the fact of our own existence as one of its products would still give us the strongest ground for believing that Intelligent Power, immeasurably greater than our own, lives, and reigns, and may be sought, and should be found.

I have been dealing with matters which belong to the region of Metaphysics, and there is a strong disposition at present to avoid all intercourse with that, in some parts, very shadowy realm. The intention is to get rid of useless speculation on questions which can be brought to no experi-

mental test; but the effect has been to fix attention upon one class of experiments, and to withdraw it from another. We receive impressions through the senses, and draw inferences from them concerning external objects, and physical science occupies itself in dealing with those inferences; but it is at least as important to consider the actual experience on which all inference depends. The examination of our own mental states is experimental science of the strictest kind; and it has this extraordinary advantage, that all its facts are certainties, if we take the trouble to ascertain them. When we receive impressions of sight, it is always possible to doubt the existence of an outward object; but the existence of the impressions cannot be doubted; it is a fact of absolute, not of inferential, knowledge. And what are these impressions? What are thought, and inference, and observation? What are human experience and human language? None of these questions can be answered, even superficially, without plunging into the very depths of metaphysics. Conscious of this, and aware of the profound difficulties which must be encountered in this field, many earnest students of science are anxious to separate their favourite studies from all inquiries of this kind, and to induce the scientific world to content itself with the observation of facts, and of the practical laws of their occurrence. But the attempt must always be in vain. It is not a dead, but a living, universe that meets our eyes. There is no branch of science which does not lead ultimately to the study of that which is alive; and how can we, longing for life, and yet reminded everywhere of the shortness of our days, be indifferent to the very questions which are the first to arise when we consider the nature of any living thing? The difficulties must be met; they cannot be evaded. What is needed is not that the study of that which lies behind the inferences of the senses should be discarded as a vain pursuit, but

that it should be entered upon with greater vigour and exactitude, with a determination to understand what is to be understood, and at least to master in it that which lies at the foundation of all sound reasoning, the knowledge of what it is that we take for granted.

The irrepressible nature of the whole inquiry concerning life itself is very clearly shown by those reasonings upon the origin of man with which we are now familiar. Led by scientific research to the idea that what is complex must have a beginning in what is simple, and discarding for the time the equally demonstrable truth that what is simple must be taken from what is complex, modern science has hastened to the conclusion that whatever life is at present, it must have been simpler in the past; and, complexity in human life being considered synonymous with civilisation, the idea of a universal barbarism at some former period has seemed to be a necessary inference in the history of man. Certain facts in favour of this idea have been seized upon with a species of enthusiasm. Our pedigree has been traced, not to gods and heroes as of old, but to cave-men and cannibals; and a vast amount of information, most valuable and interesting in itself, has been already collected by Mr. Tylor, Sir John Lubbock, and others, about the thoughts and habits of savage tribes.

I cannot doubt that a more profound psychology would entirely change the nature of the discussion, and would put an end at once to a vast number of crude ideas; but instead of approaching the subject from the psychological side, I shall ask you to consider it as it stands affected by our present knowledge concerning the antiquity of the human race.

The old chronology has ceased to be defensible, and has to be laid aside altogether as either a mistake or a misunder-

standing. Between these two alternatives, science has no means of determining, and, indeed, no interest in trying to do so; and those who feel any difficulty in the matter on theological grounds may remember that, as we in fact know very little about the mode of estimating time in very ancient days, nothing is more likely than that the reckoning should have been misunderstood.

That we have been wrong, however, is certain; and although a new chronology of the remote past cannot yet be constructed, it is at least not improbable that some of the remains of human workmanship already in our museums are a hundred thousand years old. There is not a single reason for supposing that these are the oldest we are likely to find. Most of them have been discovered only during the last fifteen years. They have been found only in special places, and the places themselves have become known by accident; and the present land above the sea, and the former land beneath it, remains unexamined except in these spots, which are in truth mere specks upon the surface. It is certainly a fact that no theory concerning the history of mankind can be worth much attention now, if it would be inconsistent with the existence of men upon the world a hundred thousand years ago.

Now the theory set up by anthropologists of the modern school is, that certainly men existed at that remote period, but that they were all savages, and that the history of our race has been that of gradual progress from a savage to a civilised state. This theory agrees with the general doctrine of evolution, and with the views of Mr. Darwin, and with the common interpretation of the geological record. It finds a natural place in that conception of the universe which represents everything as beginning in formless chaos, out of which a more and more perfect order has slowly been developing.

The question has, of course, been beset with theological difficulties, but these may all be laid aside. It is understood at last that, if natural forces produced the world and its inhabitants, something else produced the natural forces, and that any debate on this ground between science and theology can refer only to modes of procedure, and must leave untouched the question of their cause. I do not mean that no practical difference results from our theories on these subjects, but that, while we are dealing with them as theories, we may do so with perfect peace of mind, knowing beforehand that from their very nature they can never lead to anything by which theology is necessarily superseded.

Now on the question of fact, I shall say at once that the doctrine of an ancient world, peopled only by savages, seems to me a too hasty generalisation from evidence both insufficient in its nature and incorrect in its interpretation.

The sum of the evidence is as follows. Implements of flint and bone, such as are now made by savage tribes, are found on the surface of the ground, and in burial places, in most parts of the world. Similar implements, generally of a ruder kind, are found in many caverns, deeply imbedded with the bones of extinct animals; and in certain gravel beds, of equal or greater antiquity, they are also found, the forms being still ruder. Many bogs, shell mounds, and the remains of lake dwellings yield similar testimony; and through the whole series, there is an absence of metal among the earlier remains, while bronze and iron occur generally in succession afterwards.

These facts are indisputable; and, at first sight, the inference drawn from them appears equally so.

But we meet on reflection with one great preliminary difficulty. Suppose the world peopled only by the makers of these rudest tools. They were not beings of a lower nature than our own. The evidence before us points to

nothing materially different from human life as it is found at present among uncultivated tribes. How long can we believe that they could all remain in that primitive condition, and by what kind of process can we account for civilisation? Barbarism, so far as we know it, is not a condition of great and permanent stability; nor is the civilisation of a race of men a very slow and gradual process, when it occurs at all. To suppose that races who lived with the mammoth and the reindeer in the South of Europe, and who, in that severe climate, were skilful enough to make the flint tools of the river drift and the bone needles of the caves, and to carve the shapes of animals on horn and stone, could remain savages for perhaps a thousand centuries, and then develop into the conditions of civilisation, is at least very unlikely. Yet, this is the proposition involved in the modern theory; for, unless we know that the whole world was once barbaric, we cannot know that barbarism developed by itself into civilised life; and if there was a time when all men were savages, they must have continued so till the first civilised race was formed. And unless no such race was formed till comparatively recent times, there is no such proof of a universal barbarism as we have been pre-supposing. This is a real dilemma, out of which escape is difficult.

What kind of men are they who, with the whole world before them, could remain in a savage state through such vast periods of time, and yet possess and retain the qualities which enabled them, in more recent days, to civilise themselves?

So far as I am aware, no attempt has been made to answer this question, and it justifies us at all events in considering closely how far the modern doctrine is a necessary inference from the facts we know.

The first thing to notice is, that the theory rests almost entirely upon negative evidence. It is not the presence of

rude implements, but the absence of better ones; not the proof that there were savages, but the want of proof that there were civilised men, in the far off ages of the world, that gives strength to the reasoning. If there was civilisation in those days, where are its remains? And why is it that, when we do find vestiges of human works, the oldest are the rudest? These are fair questions, but I think they can be answered without admitting the inference that has been drawn.

The works of man are, for the most part, as fragile as himself. They perish rapidly, and generally the most elaborate art is the least enduring. The most useful metals, iron especially, corrode and disappear, if exposed for centuries to air and water. In thickly populated countries, old works of almost every kind are constantly used up as materials for newer ones. The obliteration of the past is rapid, as the activity of the present is great; and if we look for antiquities, our best chance of finding them is always either in deserted lands, or in spots where, by some exceptional means, they were hidden before they were destroyed. And as the only permanent hiding place is in the ground, the only relics of very great age are objects that, by some means, have been buried where they could neither perish nor be disturbed. Accordingly, it is in caves under floors of stalagmite, and in ancient gravel beds, where they have been preserved like fossils, that the earliest remains of human workmanship have hitherto been found. But caves, at any period of the world, are not likely to have been the dwelling-places of civilised men, so that we cannot expect to find in them the relics of civilisation, and the nature of the river drift makes their presence in it equally improbable. For that drift has been formed either by the floods of swollen torrents, or the more gradual process of deposition at the bottom of rivers. Civilised men generally keep themselves out of the reach of inundation, and most objects of human workmanship dropped

into rivers have little chance of being permanently preserved, unless they are themselves almost indestructible.

Now flints, and siliceous stones generally, are among the most enduring substances known to us. Neither the rush of water, nor the fall of rocks, nor the grinding of pebbles, nor long exposure to air, moisture, or heat is sufficient to destroy them. They remain almost unchanged, where every trace of wood or metal would disappear, and there is, therefore, an inherent probability that, in our search for relics of the past, the oldest we are likely to find will be such as are made of these materials. And since they are the materials which have been used by savages much more generally than by civilised men, the history of savage life is what we must expect to find revealed by them. On the other hand, the entire absence of any remains of civilised life during these distant epochs would, if it were certain, be sufficient to sustain the modern theory; for, though flint hammers and chisels would remain unaltered, while the iron tools of an English carpenter rusted away, there are, of course, many objects that may exist for ages among the works of higher art and skill. Gold and jewels are too rare to be of much account, but glass and pottery are abundant; and pottery, at all events, is likely to have been so among any civilised races who may have existed since the reindeer period of Europe. But the question, Why do we not find such relics of ancient days? must be answered by two other questions. Where are we likely to find them? and Where have we looked? Nothing of so great an age could remain preserved upon the surface, and we must therefore look for them under ground. What are their probable burial places, and to what extent have they been examined?

The inquiry leads at once to some very important considerations, most of which have, I think, been partially forgotten.

At present, three-fourths of all the people in the world are found in China, India, Europe, and the United States. The area of all these countries put together is only about one-fourth of the habitable land. The rest of the land is inhabited chiefly by savages, or semi-civilised tribes, the spots of civilisation upon it being at present small, both in area and population. The concentration of a large number of men within a small area is the necessary condition of progress in human art. Men cannot become skilful artificers unless they have time to acquire skill, and a strong reason for taking the trouble ; and neither the time nor the reason can be found while they are thinly scattered. The earnings of England at the present day are probably as great as has ever been possible to any race of men ; yet, they amount to only about twice as much as the average cost of the necessities of life. If the whole were equally divided, every family of five would have an income of about two pounds a week. There are perhaps four million families whose income is not more than one pound a week, and there is, in consequence, a surplus of four million pounds a week out of their average production. This surplus is the basis of all our material progress, nor is material progress possible on any other foundation. There is no wealth anywhere unless a large number of workers are living in the simplest way, while the extra product of their work is collected together ; and there is no progress in human industry till wealth itself, and the hope of getting it, act together as the support and the reason for exertion. Where every man enjoys the whole fruit of his own labour, all men are of necessity very poor. They are also of necessity thinly scattered, and are in fact in the normal condition of savage life. It follows that all nations in which the arts have made that progress which we associate with the idea of civilised life, must always have been thickly peopled ; and it follows from this that, unless the whole

population of the world has been very much larger than it is now, which is extremely unlikely, civilisation must always have been confined, as now, to a comparatively small portion of the habitable land. How small this portion really is we can hardly understand, unless we bring before our minds the vast spaces of country in even the most populous lands which are in fact unoccupied, or are only passed over now and then by human beings, who leave no trace whatever of their existence. When this is fully realised, we shall understand, in the first place, that remains of human workmanship are not to be looked for everywhere, even in the countries where they are most abundant, and most likely to be found.

There is geological proof of glacial action and biological evidence of an arctic climate as far south as the Mediterranean, within comparatively recent times. We know that man and the reindeer lived together not far from the Pyrenees. The immediate effect of this knowledge is to strike out the whole of Europe from those divisions of the world in which it would be natural to look for signs of ancient civilisation. Men cannot be numerous in frigid regions, and would not if they could; but our knowledge of man's antiquity is derived chiefly from European remains. It is from Kent cavern and the rocks of the Dordogne, from the valleys of the Ouse and the Somme, from objects found in Germany and Denmark, that we have got most of our information. The whole of this must be set aside, if we mean to judge the matter impartially. The ancient history of Europe must of course be the history of barbarism. Whatever may have been the sites of former civilisation since the last glacial period, it is not here that they can be found.

Nor is it possible, with our present information, to fix with any certainty on more likely places. We have to bear in mind that an area, much exceeding that of all the dry land in the world, lies at present under the Pacific ocean;

that there are other oceans also as large as continents ; that land and sea are always changing places ; and that we are quite unable to draw a chart of the earth as it existed a hundred thousand years ago. To infer from negative evidence that there were no civilised nations at that remote period, is to assume a knowledge of data which at present are totally beyond our reach.

There is, however, a general belief that civilised races can never pass into oblivion, but must hand down their own history, in writing or in tradition, to the remotest time. This belief is full of interest, but it rests, I think, mainly on that natural egotism by which we exaggerate our own importance, and forget that our successors, like ourselves, will be far more interested in the present and the future of their own lives than they can be with the past. The truth is, that the history of all civilised races goes back to a certain distance, and there ends in mythology. But mythology is not a description of savage life. It is not a tradition of something worse, but almost always of something better, than the matter of fact which follows it ; yet it is not history. And even in what are called historical times, what do we really know about the old Egyptians, the Assyrians, the Persians, the Chinese before Confucius, the Hindoos before Alexander the Great ? Our whole knowledge of the Aryan race begins with the Vedic hymns. But these are the hymns of a noble and cultivated people. Where is the history of their ancestors ?

History, it must be remembered, is only preserved so long as it is interesting ; and generally human beings have no interest in anything that happened several thousand years before their time. The love of antiquarian research is not a permanent passion in the human mind. It is probably entirely unknown to the great majority of men ; and among those races and classes in which it breaks forth at times with

great intensity, the active causes are intermittent in their nature. Continued research requires the stimulus of successful discovery. When any particular field is exhausted, our interest flags, and at last expires, unless it is again excited by the opening up of regions hitherto unexplored. So that there have been, and doubtless always will be, long periods of quiescence in our relations with the past, and these become ultimately impassable gulfs in the stream of history, where, instead of friendly shores and guiding beacons, we come suddenly upon mist or darkness, or a stretch of mere blue distance, through which nothing is discerned. Nor does it seem likely that the invention of printing will make any great difference in the backward range of authentic history. No printed book will last for two thousand years; and when the books of any epoch have all perished, nothing will remain of their record, except what has been transferred to newer literature; and as newer literature only makes use of what is interesting at its own period, there is a perpetual winnowing away of the older story. When we add to this the changes which occur in every language and in every nation, the rapidity with which dialects become unintelligible, and the frequent transfer of the world's intellectual activity from one race to another, we shall, I think, find reason to believe that civilisation, as it now exists, will not prevent human history from being always limited in its retrospect, and, in consequence, that the loss of it in former times is no real proof of the absence of former civilisation.

But a still higher question is involved in the mere use of this word, civilisation. What do we mean by it? What is its value? And what facts are we looking for when we inquire into its history? Clearly the word refers to man himself, and not either to his works or his surroundings. It is his intellectual and moral being that we speak of,

and we call him civilised or not, according to the culture of his mind and the character of his behaviour. It is true that when we cannot see the men themselves, we judge them by their works, knowing that mental characteristics may be inferred from their physical manifestations, but it is most important to remember in what widely different forms a cultivated race may expend its energies. An English gentleman would not cease to be a civilised being if, lost among the deserts of the world, he had to dress in leaves, and feed upon berries; and there are thousands among ourselves, using and even making the delicate products of modern art, who are as rude and barbarous as a Patagonian. Mere differences of climate and locality, altering both the necessities and the pleasures of life, are sufficient to give perfectly distinct directions to human activity. Geographical and geological changes, affecting the relations between land and sea, the nature of the soil, the materials available for use, the distribution of empire, and the position of particular races, may vary the outward character of civilisation to almost any degree; and it must be rash and dangerous to infer, with any confidence, the real state of any ancient people from the works they have left behind, unless from these or other sources we really obtain a fair knowledge of the conditions under which they lived.

The difficulty in obtaining this knowledge from the evidence of human workmanship, in which it is not the most characteristic objects, but simply the most enduring, that get preserved, gives an additional value to every written record of pre-historic times; but it has justly been observed that, as writing is itself a proof of culture, such records must always leave the question of an earlier barbarism unsolved. This is true; but, on the other hand, the theory of a savage origin for the whole human race

requires evidence of a time when there was in fact no civilisation ; and if, while the rude implements of a certain period prove that there were savages at that time in one part of the world, the remains of literature prove that there were civilised races in another part ; the whole result is simply that the world was then, as now, partly savage and partly civilised.

Now there are no written records much older than the Vedic hymns. They take us back some four thousand years, or more, and the Sanskrit in which they were written is itself a proof of culture at a much earlier date. But this language can be traced down to certain roots which have acquired great theoretical importance. The roots are monosyllables, and it has been commonly assumed that when you have arrived at monosyllables you must be close upon the beginnings of human speech. I must, of course, speak with diffidence on such a subject, considering the high authorities who have given countenance to this view ; yet I cannot for a moment believe that it is really tenable. On what ground do we suppose that the earliest form of speech would be monosyllabic ? No savage nation at present speaks in this way. The nearest approach to a monosyllabic language is the Chinese, which is one of the most elaborately cultured. It is not a fact that children naturally speak only in monosyllables ; or that these are necessarily the easiest forms of utterance. It is easier to say Johnny than John, Better than Best, Dunna than Don't. Nor, again, is it a fact that children and savages naturally speak alike, for children speak with organs not fully formed. And nothing can be more unlikely than that a language really invented by savages should be regular and uniform in the length of its words. If some were monosyllables, others would be different. Nor do any of the theories proposed, as to the origin of language, account for any such uniformity. The cries of animals and

the sounds of nature are by no means generally such as can be imitated by monosyllables. Nor are natural interjections all of this form. And as to a language supernaturally given to man, no one can suggest a reason why it should be thus limited in the length of its words. Any system of linguistic roots, which are all alike in their structure, must necessarily be an artificial system; the result of some long process by which some kind of language has been reduced to this particular uniformity; not the first instrument by which men gave natural utterance to all the diversity of thought and feeling.

This view is very strongly confirmed by the different structure of the Semitic roots. The formation here is as regular as in the Aryan tongues, but it is quite of another kind. Each verbal root consists essentially of three consonants, and is therefore in most cases unpronounceable as a monosyllable. There is nothing to show that either of these root systems is older than the other.

Now if the Semitic roots as well as the Aryan are in fact the substance of a really primeval language, there must have been two such languages to begin with, and any theory which accounts for one of them will not be applicable to the other; while if either of these root systems is not original, but derived, it proves at once that true roots can be formed out of some older language, and can become the positive basis of a new family of tongues. In either case, therefore, the existence of systematic roots throws us upon processes in the history of speech which must have occupied an enormous lapse of time, and the date at which a truly original language can give any proof of an original barbarism is pushed back indefinitely into the unknown past.

If the details of any process by which an existing language could be reduced to the form of roots are at present not understood, it does not seem difficult to comprehend the

general nature of the change itself, and of the causes that might produce it. The first effort of men in the use of speech is to make their thoughts fully understood by others, but when this is accomplished by a sufficient vocabulary, the next effort is to do the business quickly. Our time is short; our thoughts are far more rapid than our tongues. We necessarily try to abbreviate the forms of speech. The extent to which this can be done depends greatly on the structure of the language; on the character and influence of the literature; and on the causes which lead to the introduction of foreign words. For a language to become purely monosyllabic, the most favourable condition would seem to be a state of long isolation, during which little new would be added, while the old materials, thoroughly familiar and universally understood, would gradually be ground down to the simplest intelligible form. It is most remarkable that these very conditions have probably existed in China for an unknown length of time, and that we actually find there a monosyllabic tongue. We are hardly aware of the extent to which this is approached already by the English language. In the first five verses of Genesis, five words out of every six are monosyllables, twenty-two of these being consecutive. In the Lord's Prayer; in the speech beginning "All the world's a stage;" in the first paragraph of Nicholas Nickleby, they are five out of every seven; and this is a common proportion in good English. It is easy to write English books in words of one syllable; and though these are children's books, this is because no single section of the language is sufficient for maturer thought, except in the shape of fragments. But a man may say, "I love you, now and to the end of time; with all my heart and mind; with all my soul and strength," and though every word is a monosyllable, he is using the language of full manhood, and expressing thoughts of extreme complexity.

The speakers of English are at present in the least favourable state for a systematic condensation of language, for they come into contact with all the world, and novelties, both in thought and speech, are imported daily; yet we are constantly abbreviating words and condensing sentences. When an American says, "I've been burgled"—where an Englishman would say, "My house has been broken into by thieves"—he succeeds in shortening the statement by more than half, and he invents a word, almost a monosyllable, which might easily become a root expressing the general idea of house-breaking. We do not like these changes, but we know they are inevitable; and no one, I think, could maintain successfully that the whole English tongue might not be reduced to a monosyllabic form, if sufficient time were allowed, and the circumstances were favourable. If, after this had happened, we became the conquerors of a weaker race speaking a different tongue, the probable result would be the formation of a new language, whose roots would be the monosyllables of English speech, while its actual words would be modifications of these into forms congenial with the mental and lingual habits of the conquered people. And in any such case, the words which became roots by natural selection would be those most easily understood, and therefore soonest adopted, and these would necessarily be words expressive of acts and objects perceived by the outward senses. For the purpose of speech is to make ourselves understood; and where there is any difficulty, as in the intercourse of different races, it is by reference to outward objects that our meaning must be explained. The general objective character of roots agrees with this, as does also the historical fact that most nations have been founded by conquest, and that most of the existing languages are the result of one form of speech acting upon and altering another. If the relation between more recent tongues and

those from which they are derived differs in some respects from that between the most ancient of known languages and its roots, this seems accountable for, first, by the mere lapse of time which has obliterated all traces of the origin of these roots ; and, secondly, by the consideration that, although the secular changes in human speech are doubtless analogous in kind, they can never be twice the same in all particulars. But if the formation of languages as old as Sanskrit admits of any such explanation, our knowledge of philology suggests no limit to the antiquity of man. The process is one that may be repeated any number of times, each repetition involving probably a period of many thousand years.

The fact that the remains of savage customs can be traced in the manners and traditions of all civilised races has been much dwelt upon of late. But this is what we must naturally expect on any theory. Both civilisation and barbarism move from place to place, and necessarily come into contact with each other. Every portion of the earth has probably at one time or other been occupied by savages, who always leave a certain impression upon their civilised successors. Words, traditions, and habits derived from the Red Indians will be extant in America for ages to come ; and if sufficient pains were taken, it is not unlikely that survivals of civilised thought might be discovered in the habits of all savage tribes. The custom of burning the dead, for example, might, in certain conditions of the world, be the result of the highest civilisation, adopting it on sanitary grounds ; and it is perhaps as natural to find the origin of human sacrifice in the noblest acts of self-immolation, as in any purely savage ideas about life and the unseen powers of nature.

And savages themselves may be accounted for by a theory of degradation, whatever may be said by its opponents. There can be no question but that, if the most degraded of

our own race were separated from the rest, and thrown upon their own resources in some wild region by themselves, a savage tribe would be the result. And many causes may lead to such separations.

Nor are we to assume that there is no direct evidence of national degradation on a very large scale. There is abundant proof that America, from the Ohio to the Plate, was formerly inhabited by a very numerous people, far higher than the Indians. Numbers of the Pacific Islands contain evidence of a similar kind. Discoveries of immense buildings in the interior of Africa make the same course of events probable there. Egypt has its pyramids, bearing witness to a much greater past. The deserts of Syria were once peopled by the architects and sculptors of Nineveh. That is to say, in all parts of the earth beyond the reach of glacial action, there are widely spread evidences of higher races which have been succeeded by lower ones. And if these things are on the present dry land, what may not the sea have covered ?

Moreover, it must be borne in mind that, in the decline of nations, whenever this is gradual, man himself destroys more rapidly than nature ; and the relics he leaves at last are not those of his earlier greatness, but of his final decay.

Imagine England, sinking slowly into decrepitude. Her people in its first stages would cease to multiply their works, and would content themselves with using what was already in existence. As buildings fell into decay, and machinery failed, and was abandoned ; as commerce died away, and ships lay useless, and docks and warehouses grew far too large, the languor of the time would begin to use the old materials for its daily wants ; and when a scarcity of coal and iron and a dwindling traffic brought our railways to a stand, the increased difficulty of transit would hasten the local destruction. Empty mansions, silent theatres, and

ruined churches would not long be spared. The work of the nineteenth century would vanish day by day, and would be replaced by that of a lower civilisation. As population failed, one district after another would be at last deserted, and then the proofs of man's occupation would be converted into monuments; relics of an era past away, and a story ended, with which future antiquaries might busy themselves in a future age. But these relics would tell of England, not in her greatness, but in the last hours of her decay; and it might be inferred that we were a people no higher than the mound builders of the Mississippi, instead of being the civilisers of half the world.

When anything like an unlimited antiquity for the human race in its civilised form is suggested to biologists, one special difficulty occurs to them, on which I shall say a few words. The fact, that among animals generally no particular species can exist unchanged for an indefinite time, is pretty well established; and it is felt in consequence that if the human race is to be traced back into early geological times, the men of those days must have been specifically different from ourselves. Now I think we may admit this without being the least uneasy about it. What we call specific difference is a difference in bodily organisation. It is not a difference in vital purposes or vital powers. If we compare any fish from the paleozoic rocks with any that are now existing, we find important differences in their structure; but if we think of them as conscious beings, the perception of difference vanishes. So far as their bodily organs differ, their experience in the use of them will differ also; but it is in the living creature who feels, and not in the thing that happens to be felt, that we discern the true likeness of vital being. Now men themselves, as we know them, do differ very widely in bodily structure; and there is not the

least mental difficulty in thinking of a man, who would be neither more nor less than human, with almost any amount of bodily alteration. A man may lose his legs and his arms without any change of nature, and if he were born with neither arms nor legs it might be the same.

The nature we care about is our mental nature, and there is no necessary connexion whatever, as far as our real knowledge goes, between any power of mind and any bodily shape. A man is a being who has a man's powers and feelings ; not a being who grows to a particular size, and has a certain number of bones. Birds are the best imitators of our speech ; monkeys, of our movements ; but insects probably of our mental operations. There is apparently hardly any approach among quadrupeds to the mental life of ants and other invertebrates ; and all notions about the dependence of thought upon a spinal column, a formal brain, or a certain quantity of matter, are founded upon no evidence of any kind. We may admit therefore at once, that if there were men in very ancient days, there was probably some difference between their bodily form and ours ; and we may be prepared to find their fossils, even with hoofs and tails, without prejudice to their true humanity. It is not by the shape they bore, but by the powers they were endowed with, that we must determine the condition of our ancestors.

If these suggestions are sound, the result may be summed up as follows :—

There is conclusive proof of the existence of men in the time of the mammoth and many other extinct animals ; and in the period when the reindeer lived in the south of Europe. The earliest relics yet discovered are what we may suppose to have been the tools of savages. Their actual age cannot be ascertained at present, but a thousand centuries might very well be required for the geological and other changes

that are known to have occurred since these tools were made ; and human history has no record whatever of any period approaching them in antiquity.

But there is nothing to show that the makers of these tools were the only races of men then existing. If the world was peopled then as it is now, partly by civilised and partly by savage tribes, there is no sufficient reason for believing that the evidence would be different. Flint implements have been preserved, because they are indestructible. They have been found, because from their indestructibility their number is immense, and because they have been naturally buried in gravel beds which are easily and often cut into, and in caverns, which attract our notice when their probable contents are known. They are found in all countries, because the distribution of savage and civilised life is continually changing ; and the oldest are the rudest, because in the common order of events the less skilful tribes become displaced by the more skilful. When thus displaced, they either disappear, or are driven into regions which have become unoccupied, and in which barbaric life will begin again. Such regions will of course have had an earlier history ; it may be of life in all its phases ; but they must generally have been desolated by the greater changes in climate and in surface which take place very slowly, or by the gradual dying out of a failing race ; and it is not surprising, therefore, if they contain few remaining traces of previous occupation, and none that will last so long as the rude stone implements of barbarism.

In this manner we may conceive that cycle after cycle of successive change may occur, in a world peopled as we find it now, without any essential difference in the character of its antiquarian remains. There will of course be periods of more or less activity ; eras of great discoveries, which affect

the habits of whole races, perhaps of the whole world ; ages of comparative stagnation, when nothing new is discovered, when the incitements to human effort are feeble, and arts are lost, and important truths forgotten, and a general languor ends in a general decay ; and then ages of revival, when some obscure family or tribe wakes to a nobler life, finds itself among unused opportunities, becomes a nation and an empire, and begins another age of gold.

Such a view of human nature is in harmony with the highest teachings of geology, and of philosophy in its profoundest moods. For these assure us that the search after the true beginning of anything has hitherto been vain ; that the present order of things has existed at least far beyond the reach of our present gaze ; and that we are much more likely to find an explanation of the phenomena around us by assuming that the past has been like the present in all essential particulars, than by allowing our fancy to construct new conditions in order to account for what we see.

Certainly the belief that not only savages but men equal to ourselves have lived for unknown ages, through successive periods of geological time, gives at least a fresh nobility to all archeological pursuits. Instead of looking chiefly for ape-like forms and proofs of ignorant barbarity, we shall look for evidences of human greatness in the distant past, and shall begin to consider where we may hope to find them. It will hardly be in caves or gravel beds ; nor shall we perhaps obtain the clue till some happy accident reveals it ; but in the mean time it will be natural to turn to the sites of the oldest known civilisation, and learn what Egypt, India and China can disclose, concerning not the lower but the higher races of men. Pottery, which may be ten thousand years older than the Pyramids, has already been found

in the mud of the Nile; and effectual search in this direction has not yet begun.

I have used the great problem of the antiquity of man to illustrate the relation between science and philosophy, because science just now is busy upon matters bearing upon the nature, origin, and destinies of living beings. These are always the chief subjects of philosophic thought, and it is where our philosophy is doubtful, that our science is on these points most likely to lead us astray. Every man has a philosophy of his own on which he rests his reasonings, but the axioms of thought as they were understood fifty years ago have become to a great extent untenable. The philosophy of the future will, I have no doubt, differ from that of the past, much less in its results than in its processes; but the latter are being formed anew, and are still unformed, and we suffer in the interval. The proper lesson is one of patience and caution; an earnest interest in the acquisition of all knowledge, but a steady forbearance from hasty inferences, formed on limited experience, and unsupported by wider truths. The spirit of this forbearance is far more likely to arise from breadth of survey than from a more perfect but less comprehensive study of details, and it is in consequence the spirit we may hope to cultivate successfully in a Society like our own.

